



# Grades 9 to 12 Carpentry

Manitoba Technical-Vocational  
Curriculum Framework  
of Outcomes





GRADES 9 TO 12  
CARPENTRY

Manitoba Technical-Vocational Curriculum  
Framework of Outcomes

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[www.edu.gov.mb.ca/k12/cur/teched/sy\\_tech\\_program.html](http://www.edu.gov.mb.ca/k12/cur/teched/sy_tech_program.html).

Available in alternate formats upon request.

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# TECHNICAL-VOCATIONAL EDUCATION OVERVIEW

In 2013, Manitoba Education released the document *Technical-Vocational Education Overview*, available at [www.edu.gov.mb.ca/k12/cur/teched/sy\\_tech\\_program.html](http://www.edu.gov.mb.ca/k12/cur/teched/sy_tech_program.html), to provide the philosophical and pedagogical underpinnings for curriculum development and the teaching of technical-vocational education (TVE) courses in Manitoba. This overview presents educators with the vision and goals of TVE in Manitoba.

Topics include the following:

- curriculum revitalization and renewal
- curriculum framework and implementation
- articulation of programming
- assessment and reporting
- safety
- employability/essential skills and career development
- sustainable development

TVE clusters of courses are designed to encourage students to explore career options in designated trades and trained occupations and to address labour shortages in these areas. The TVE curriculum includes course clusters for both *designated trades* (trades designated for apprenticeship training and certification by Apprenticeship Manitoba) and *trained occupations* (not designated as trades).

The TVE curriculum is significantly different from other subject areas, such as industrial arts. It has distinctive qualities which, when respected, will provide students with a uniquely valuable experience that they cannot receive from any other curriculum.

TVE gives students the opportunity to learn, from an industry-certified teacher with industry experience, the theoretical and practical aspects of one specific trade or trained occupation in order to facilitate their transition from school to work or to post-secondary education in that trade or trained occupation (including journey person status from Apprenticeship Manitoba), or into an associated trade or occupation. This transition is accomplished by having students complete an entire TVE cluster of courses in a setting that, as much as possible, emulates an actual workplace.

The TVE curriculum includes Grades 9 to 12 courses in a variety of areas, including carpentry.

## CARPENTRY OVERVIEW

*Grades 9 to 12 Carpentry: Manitoba Technical-Vocational Framework of Outcomes* identifies the goals, general learning outcomes (GLOs), and specific learning outcomes (SLOs) for nine carpentry courses. This framework is intended for use in all Manitoba schools teaching carpentry courses as part of the Senior Years Technology Education Program.

## Carpentry as a TVE Cluster

*Grades 9 to 12 Carpentry: Manitoba Technical-Vocational Framework of Outcomes* has been developed as a technical-vocational education (TVE) cluster of courses.

The carpentry curriculum prepares students for a career as carpenters, which has been designated as a trade by the regulations under *The Apprenticeship and Certification Act* (Manitoba), and is administered by Apprenticeship Manitoba. For more information on trade programs, refer to “Manitoba Trades” on the Apprenticeship Manitoba website at [www.manitoba.ca/wd/apprenticeship/discover/mbrades/index.html](http://www.manitoba.ca/wd/apprenticeship/discover/mbrades/index.html).

Like all other TVE courses, the carpentry courses should be taught only as part of a complete cluster, approved by Manitoba Education and Training.

## 2016 Revisions to the Carpentry Curriculum

During the 2015/2016 school year, a committee of carpentry teachers was struck to make significant revisions to the high school carpentry curriculum. The curriculum, course names, and course codes for all of the Grades 11 and 12 courses were changed in order to reflect the changes to the *Carpenter Level 1* curriculum from Apprenticeship Manitoba. The *Carpenter Level 1* curriculum had undergone major revisions as part of the National Harmonization Initiative which aligned trades training across Canada. This high school curriculum reflects the changes made as a result of the harmonization initiative.

Also, there were minor revisions made to the Grades 9 and 10 courses, but their names and course codes were not changed.

## Role of Carpenters

Apprenticeship Manitoba describes the role of carpenters as follows:

Carpenters work on a wide variety of tasks associated with building and repairing whole, or parts of, buildings and other structures made of wood, wood substitutes, steel and other materials. Working in all areas of both the private and commercial construction industries, as well as in maintenance and renovations, carpenters crib basements, build house frameworks, walls, roofs and exterior finishes, and install doors, windows, flooring, cabinets, stairs, handrails, panelling, moulding and ceiling tiles. They are also responsible for building concrete forms, scaffolding, bridges, trestles, tunnels, shelters, towers and other structures. (Manitoba, “Carpenters”)

## Career and Employment Opportunities

A student who has completed the carpentry cluster can seek entry level employment on a construction site in a variety of positions. Such graduates are employed by residential, commercial, or industrial construction sectors. Students can also continue into post-secondary studies or apprenticeship in a variety of areas related to building construction. The opportunities range from labour to professional occupations. The career paths can be classified as follows:

- Labour – machine operator; general labourer
- Trades – carpenter and specializations; electrician; plumber; concrete finisher
- Technical – surveyor; building inspector; salesperson; draftsman; site inspector
- Professional – architect; engineer; vocational teacher

Specific related work that students can do upon completion of the carpentry courses include the following:

- forming concrete systems
- floor, wall, and roof framing
- timber framing
- exterior finishing (siding, soffit, fascia, trough, roofing)
- interior finishing (doors, interior trim)
- window and door installing
- cabinetry and furniture manufacturing
- flooring installing
- interior systems mechanics (metal studs, drywall, suspended ceilings, insulation, and vapour barrier)
- stair and truss manufacturing

## Implementation of Carpentry Courses

To receive a Senior Years Technology Education Program (SYTEP) diploma, a student must complete a minimum of eight departmentally developed courses from an approved TVE cluster, together with 16 compulsory credits and six optional credits.

Students must complete the eight mandatory courses from the Grades 10 to 12 carpentry curriculum to earn their SYTEP diploma and to meet the Level 1 apprenticeship training requirements for carpenters. Students do not need to complete the optional Grade 9 course in order to graduate from SYTEP or to meet the Level 1 apprenticeship requirements.

## Level 1 Apprenticeship for Carpenter

Students completing the carpentry cluster of courses have the opportunity to complete their Level 1 apprenticeship training for carpenter, since this cluster may only be taught by a journeyman carpenter, and the curriculum includes all of the objectives from *Carpenter Level 1* from Apprenticeship Manitoba, available on the Apprenticeship Manitoba website at [www.manitoba.ca/wd/apprenticeship/pdfpubs/pubs/discover/mb\\_trades/carpenter/carpenter\\_lev1.pdf](http://www.manitoba.ca/wd/apprenticeship/pdfpubs/pubs/discover/mb_trades/carpenter/carpenter_lev1.pdf).

In addition to including all of the Level 1 apprenticeship objectives for carpenter, the courses also include learning outcomes related to the construction or renovation of structures. Other topics include surveying, trade documents, concrete, framing, interior and exterior finishing, and millwork.

Carpentry teachers should refer to the document entitled *Unit to Course Comparison (UCC) Form – Carpenter Level 1*, available on the department website at [www.edu.gov.mb.ca/k12/cur/teched/sytep/carpentry/ucc.pdf](http://www.edu.gov.mb.ca/k12/cur/teched/sytep/carpentry/ucc.pdf). This form lists under which learning outcome each apprenticeship objective is taught in this high school curriculum. Teachers will find this document helpful in applying to have their courses accredited with Apprenticeship Manitoba.

## The Multi-Course and Individual-Course Formats

This curriculum has been developed in two different formats. The **multi-course format** (found in this document) is comprised of either five columns (one course each in Grades 9 and 10, and three in Grade 11) or four columns (the four Grade 12 courses). It is found in this document, starting on page 13.

The **individual-course files** are made up of one course per file. Those nine files are found at [www.edu.gov.mb.ca/k12/cur/teched/sytep/carpentry/index.html](http://www.edu.gov.mb.ca/k12/cur/teched/sytep/carpentry/index.html).

The multi-course and individual-course formats have been developed for different reasons and serve different purposes. The most important difference is that the multi-course files (containing four or five columns) **do not contain**

**all of the content**. Specifically, while they contain all of the specific learning outcomes (SLOs), they **do not contain all of the detailed content** associated with each SLO. That detailed content is found only in the individual-course files. Therefore, **teachers need to use the individual-course files**.

The multi-course format does not contain all of the content simply because there is not enough room for it. If it were to contain all of the content, some individual SLOs and their content would fill a narrow column for several pages, making them impossible to read.

However, teachers find the multi-course format very useful, because it allows them to compare the four or five courses listed there, and to see how students progress from one course to the next within each goal and general learning outcome.

The SLOs in this curriculum that correspond with the Apprenticeship Manitoba objectives from *Carpenter Level 1* have an alpha-numeric code at the end, which indicates the unit and objective from which they were taken.

Here is an example of an SLO and its content taken from Carpentry Level 1. Each of those SLOs have an alpha-numeric code at the end, which indicates exactly where the SLO was taken. For example, 9194 Applied Carpentry includes the following SLO 12D.8.1.1:

12D.8.1.1 “describe the structure and scope of the modern carpenter trade. (A1.1)”

A1.1 indicates that the SLO is Objective 1 from Unit A1 Orientation I: Structure and Scope of Carpenter, from page 1 of *Carpenter Level 1*: [www.manitoba.ca/wdis/apprenticeship/pdfpubs/pubs/discover/mbtrades/carpenter/carpenterlev1.pdf](http://www.manitoba.ca/wdis/apprenticeship/pdfpubs/pubs/discover/mbtrades/carpenter/carpenterlev1.pdf). The Level 1 document also includes the following essential content:

1. Describe the structure and scope of the modern carpenter trade.
  - a. historical background, including apprentice experience
  - b. structure/scope of the trade
    - international and national characteristics
    - characteristics and practice of the trade in Manitoba
    - trade organizations
  - c. opportunities and career ladders
    - generalists and specialists
    - lead hands and other immediate supervisors
    - geographic mobility
    - job hierarchies and innovations

These details are a necessary part of this curriculum. So, when teaching this SLO, teachers must ensure that they are covering each point listed. Teachers also need to become familiar with the Carpenter documents from Apprenticeship Manitoba. These documents provide invaluable background to this curriculum, and are found at [www.manitoba.ca/wdis/apprenticeship/discover/mbtrades/carpenter.html](http://www.manitoba.ca/wdis/apprenticeship/discover/mbtrades/carpenter.html).

For more information on accreditation, see “Information for Instructors and Educators” on the Apprenticeship Manitoba website at [www.gov.mb.ca/wd/apprenticeship/generalinfo/instructoreducators.html](http://www.gov.mb.ca/wd/apprenticeship/generalinfo/instructoreducators.html).

## Trade Safety Awareness Manual

Apprenticeship Manitoba has developed a Trade Safety Awareness Unit, the purpose of which is to increase student awareness of trade safety in the workplace. All students, including those in high school, studying a designated trade must complete this seven-hour unit.

In this carpentry curriculum, the learning outcomes from the Trade Safety Awareness Unit are incorporated into Goal 1 of 9194 Applied Carpentry. The Trade Safety Awareness Unit’s alphanumeric designations are located at the end of the applicable SLOs in this framework.

For example, the following SLO is found in 9194 Applied Carpentry:

12D.2.7 Define workplace safety and health hazards.  
(TSA 7)

The *TSA 7* code indicates that this SLO is taken from Apprenticeship Manitoba’s Trade Safety Awareness Unit.

For more information, and to access the Trade Safety Awareness Unit and its tests and other resources, see “Information for Instructors and Educators” on the Apprenticeship Manitoba website at [www.gov.mb.ca/wd/apprenticeship/generalinfo/instructoreducators.html](http://www.gov.mb.ca/wd/apprenticeship/generalinfo/instructoreducators.html). Also see *Instructor Trade Safety Awareness Manual* (Manitoba Jobs and the Economy) at [www.gov.mb.ca/wd/apprenticeship/pdfpubs/pubs/general/trade\\_safety/instructor.pdf](http://www.gov.mb.ca/wd/apprenticeship/pdfpubs/pubs/general/trade_safety/instructor.pdf).

## Red Seal Resources

Because carpenter is a designated Red Seal trade across Canada, the Apprenticeship Manitoba curriculum is aligned with the Canada-wide Red Seal curriculum. High school carpentry teachers, as well as students working towards their Level 1 apprenticeship for carpenter, can find valuable resources in *Carpenter* section of the Red Seal Program website at [www.red-seal.ca/trades/c.1rp.2nt.2r-eng.html](http://www.red-seal.ca/trades/c.1rp.2nt.2r-eng.html). For example, teachers and students can find sample examination questions used on Red Seal examinations.

## Resources from the Learning Resource Review

Departmental staff worked with a group of carpentry teachers to identify learning resources appropriate for the carpentry courses. The results of the resource review can be found at [www.edu.gov.mb.ca/k12/learnres/tech\\_voc/carpentry\\_9-12\\_bib.pdf](http://www.edu.gov.mb.ca/k12/learnres/tech_voc/carpentry_9-12_bib.pdf).

## Qualifications of Carpentry Teachers

Only vocationally certified teachers should teach TVE courses, including the ones in this carpentry cluster.

Vocational certification includes three components:

- **Trade Certification:** Carpentry teachers need to have personally experienced the apprenticeship and journey person process, so that they can share it with their students.
- **Trade Experience:** Carpentry teachers need to have been employed as carpenters for at least six years (including their four-year apprenticeship). This will enable them to share their industry experience with students, which will, in turn, prepare them for working as carpenters.
- **Technical Vocational Teaching Certificate:** TVE teachers should have a technical vocational teaching certificate, obtained by completing Red River College’s one-year Technical Vocational Teacher Education diploma program. For information about this program, see [rrc.mb.ca/Catalogue/ProgramInfo.aspx?ProgCode=TECVF-DP&RegionCode=WPG](http://rrc.mb.ca/Catalogue/ProgramInfo.aspx?ProgCode=TECVF-DP&RegionCode=WPG)

Employing only vocationally certified teachers to teach TVE courses preserves the integrity of TVE programming by ensuring that teachers are able to share their first-hand experience working in carpentry, their familiarity with industry certification, and health and safety requirements. Students receive instruction from somebody who has been involved in that trade.

Apprenticeship Manitoba certifies TVE clusters offered in Manitoba schools only if they are taught by a vocationally certified teacher. Without a vocationally certified teacher, students' pathways to further study and careers are limited.

School boards risk significant liability if they employ non-vocationally certified teachers to teach TVE courses. Vocational certification confirms that a teacher has the requisite skills and knowledge to teach carpentry safely, reducing the risk of accident and injury.

For further information, see "Professional Certification: Technical Vocational Teacher" on the Manitoba Education and Training website at [www.edu.gov.mb.ca/k12/profcert/certificates/vocational.html](http://www.edu.gov.mb.ca/k12/profcert/certificates/vocational.html).

Although carpentry and industrial arts woodwork curricula share some common content, they have been developed for completely different purposes, and have significant differences in content. The chart on the following page summarizes some of the differences between carpentry (as a TVE cluster of courses) and woodwork technology (as an industrial arts cluster of courses).

## Comparison of Carpentry with Industrial Arts Woodwork

Like all TVE curricula, *Grades 9 to 12 Carpentry: Manitoba Technical-Vocational Framework of Outcomes* has been developed to prepare high school students for a career in one specific trade. In this case, students will learn the knowledge, skills, and attitudes required to work as carpenters. It has not been developed as a general interest cluster of courses in woodworking. Schools interested in teaching such a course are invited to teach the Industrial Arts curricula, which can be found on the department's website at [www.edu.gov.mb.ca/k12/cur/teched/ind\\_arts.html](http://www.edu.gov.mb.ca/k12/cur/teched/ind_arts.html).

## Comparison of Carpentry with Industrial Arts Woodwork Technology

Frequently Asked Questions	Carpentry	Industrial Arts Woodwork
1. Is the purpose of the curriculum to facilitate students' transition to the carpenter trade?	Yes	No
2. Does the instruction try to emulate, as far as possible, a carpentry workplace?	Yes	No
3. Does the curriculum mandate employability skills such as punctuality and time management?	Yes	No
4. Is the teacher required to be a journeyperson carpenter?	Yes	No
5. Is the teacher required to have experience working as a carpenter?	Yes	No
6. Does the cluster prepare students for certification as a journeyperson carpenter?	Yes	No
7. Does the cluster focus on preparing students for entry-level employment as a carpenter after high school?	Yes	No
8. Is the teacher required to have a Manitoba general teacher certificate?	No	Yes
9. Is the teacher required to have a Manitoba technical vocational teaching certificate?	Yes	No
10. Do schools require special permission from Manitoba Education and Training to offer a cluster of courses?	Yes	No
11. Do schools have to offer all of the courses in the cluster?	Yes	No
12. Do the clusters focus on only one trade or trained occupation?	Yes	No
13. Can schools offer hybrid clusters, made up of courses from several clusters?	No	Yes
14. Will students receive a Senior Years Technology Education Program (SYTEP) diploma when they complete a cluster of courses?	Yes	No



## Carpentry Goals and General Learning Outcomes (GLOs)

The learning outcomes for each course in the carpentry cluster are based on the following curriculum goals and general learning outcomes (GLOs). **Please note that some carpentry courses do not address all of these goals and GLOs.**

---

**Goal 1:** Describe and apply appropriate **health and safety** practices.

**GLO 1.1:** Describe and apply appropriate **health and safety** practices.

**GLO 1.2:** Demonstrate knowledge of the *Trade Safety Awareness Manual*.

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**Goal 2:** Demonstrate the identification, installation, and management of **materials**.

**GLO 2.1:** Demonstrate the identification, installation, and management of **materials**.

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**Goal 3:** Demonstrate the identification, use, and management of **tools, equipment, fasteners, and adhesives**.

**GLO 3.1:** Demonstrate the identification, use, and management of **tools and equipment**.

**GLO 3.2:** Demonstrate the identification, use, and management of **fasteners and adhesives**.

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**Goal 4:** Demonstrate the basic **skills** of carpentry.

**GLO 4.1:** Demonstrate the skills related to **project drawings and specifications**.

**GLO 4.2:** Demonstrate the carpentry skills related to **layout, measurement, and assembly**.

**GLO 4.3:** Demonstrate the ability to determine **elevations** and lay out **building lines**.

**GLO 4.4:** Demonstrate the knowledge and skills associated with **concrete foundations**.

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**Goal 5:** Follow the **ethical and legal standards** that pertain to carpentry.

**GLO 5.1:** Demonstrate an awareness of the **ethical and legal expectations** of carpenters.

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**Goal 6:** Demonstrate **employability skills**.

**GLO 6.1:** Demonstrate **employability skills**.

**GLO 6.2:** Demonstrate **critical thinking** skills.

**GLO 6.3:** Demonstrate respectful interactions with individuals of different **cultures**.

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**Goal 7:** Demonstrate an awareness of **sustainability** as it pertains to carpentry.

**GLO 7.1:** Describe the impact of the construction industry on **human sustainability** and the health and well-being of carpenters.

**GLO 7.2:** Describe the construction industry's **sustainability practices** and impact on the environment.

---

**Goal 8:** Demonstrate an understanding of the **structure and scope** of carpentry.

**GLO 8.1:** Describe the **scope** of carpentry.

**GLO 8.2:** Describe **apprenticeship, post-secondary education, and employment opportunities**.

---

**Goal 9:** Demonstrate an understanding of the **evolution** of carpentry, including its **technological progression and emerging trends**.

**GLO 9.1:** Demonstrate an understanding of the **evolution** of carpentry, including its **technological progression and emerging trends**.



9191 Surveying and Concrete 40S/40E/40M

In this course, students will demonstrate knowledge of site layout tools, equipment, and processes. They will also demonstrate knowledge of concrete and concrete products, footings, slab-on-grade, grade beam forms, and wall forms. This course includes all of the objectives found in Unit A4: Site Layout 1, Unit C1: Concrete and Concrete Products, Unit C2: Footings, Slab-on-Grade and Grade Beam Forms, and Unit C3: Wall Forms from *Carpenter Level 1*, from Apprenticeship Manitoba.

9192 Advanced Framing 40S/40E/40M

In this course, students will extend what they learned in 9189 Framing. It includes all of the objectives found in Unit B3: Temporary Access Equipment and Structures from *Carpenter Level 1*, from Apprenticeship Manitoba.

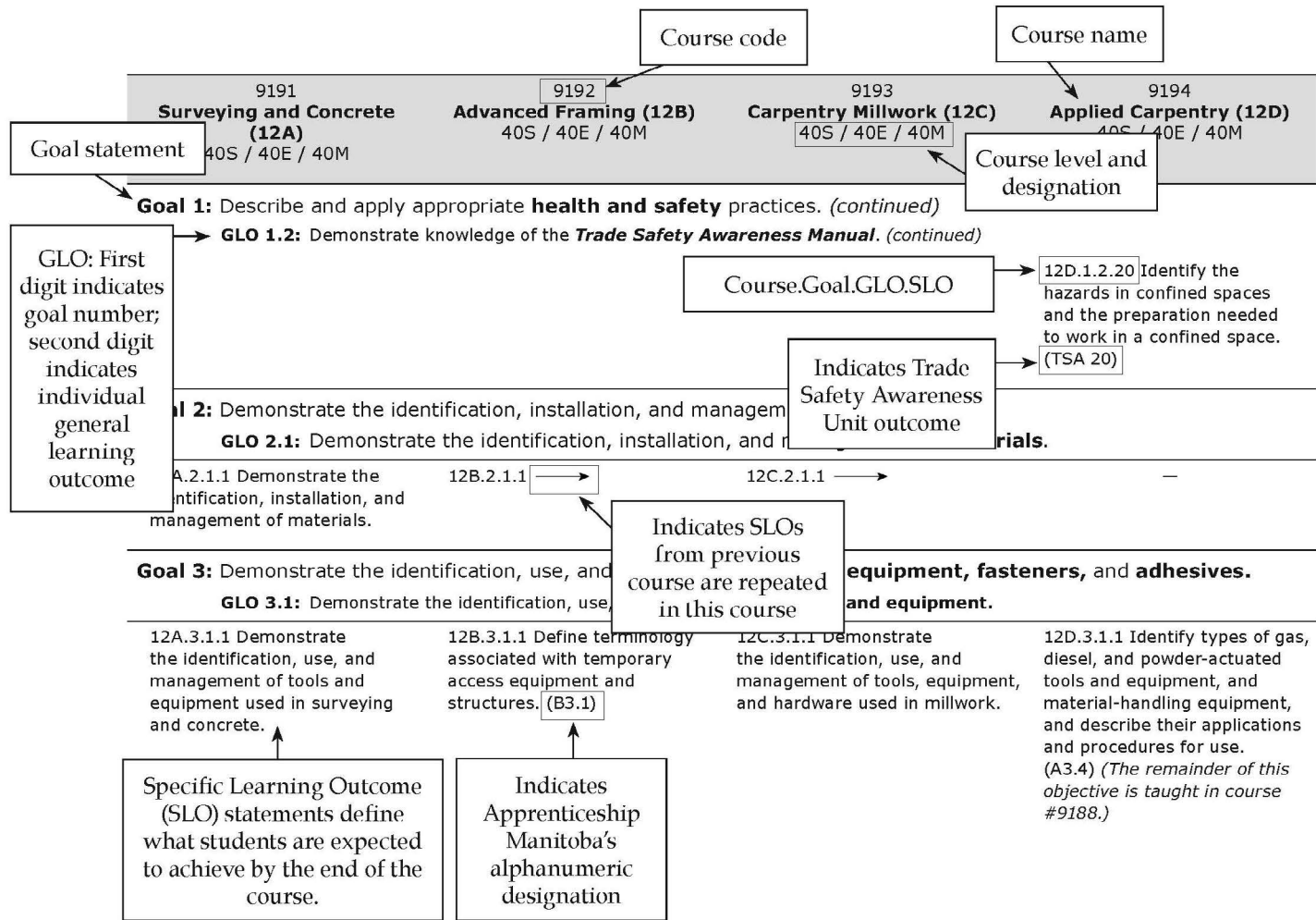
9193 Carpentry Millwork 40S/40E/40M

In this course, students will be introduced to the knowledge, skills, and attitudes related to the manufacturing and installation of millwork.

9194 Applied Carpentry 40S/40E/40M

In this course, students will synthesize knowledge, skills, and attitudes learned in previous courses to complete projects. They will also prepare for Level 1 accreditation with Apprenticeship Manitoba, and demonstrate knowledge of the *Trade Safety Awareness Manual*. The course also includes all of the objectives found in A1 Orientation I: Structure and Scope of Carpenter, and A2 Trade Safety Awareness from *Carpenter Level 1*, from Apprenticeship Manitoba.

# Guide to Reading Carpentry Goals and Learning Outcomes





GRADES 9 TO 11  
CARPENTRY

General and Specific Learning  
Outcomes by Goal



# GRADES 9 TO 11 CARPENTRY: GENERAL AND SPECIFIC LEARNING OUTCOMES BY GOAL

8584 <b>Introduction to Carpentry (9)</b> 15S / 15E / 15M 10S / 10E / 10M	8585 <b>Carpentry Fundamentals (10)</b> 20S / 20E / 20M	9188 <b>Carpentry Tools and Equipment (11A)</b> 30S / 30E / 30M	9189 <b>Framing (11B)</b> 30S / 30E / 30M	9190 <b>Interior/Exterior Finishing (11C)</b> 30S / 30E / 30M
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**Goal 1:** Describe and apply appropriate **health and safety** practices.

**GLO 1.1:** Describe and apply appropriate **health and safety** practices.

9.1.1.1 Demonstrate an understanding of and adherence to health and safety practices.	10.1.1.1 →	11A.1.1.1 →	11B.1.1.1 →	11C.1.1.1 →
	10.1.1.2 Identify personal protective equipment (PPE) and procedures. (A2.2)	11A.1.1.2 →	11B.1.1.2 →	11C.1.1.2 →
	10.1.1.3 Identify safety requirements as they apply to WHMIS with emphasis on the following: <ul style="list-style-type: none"> <li>• WHMIS as a system</li> <li>• provincial regulation under <i>The Safety and Health Act</i></li> <li>• federal <i>Hazardous Products Act</i></li> <li>• WHMIS generic training</li> <li>• description of WHMIS (include varieties of WHMIS certification) (A2.8)</li> </ul>			

8584 <b>Introduction to Carpentry (9)</b> 15S / 15E / 15M 10S / 10E / 10M	8585 <b>Carpentry Fundamentals (10)</b> 20S / 20E / 20M	9188 <b>Carpentry Tools and Equipment (11A)</b> 30S / 30E / 30M	9189 <b>Framing (11B)</b> 30S / 30E / 30M	9190 <b>Interior/Exterior Finishing (11C)</b> 30S / 30E / 30M
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**Goal 2:** Demonstrate the identification, installation, and management of **materials**.

**GLO 2.1:** Demonstrate the identification, installation, and management of **materials**.

9.2.1.1 Identify hazards and describe safe work practices pertaining to handling wood and wood products. (A6.2)	10.2.1.1 →	11A.2.1.1 →	11B.2.1.1 →	11C.2.1.1 Define terminology associated with non-wood products. (A7.1)
9.2.1.2 Identify hazards and describe safe work practices pertaining to handling non-wood products. (A7.2)	10.2.1.2 Define terminology associated with wood and wood products. (A6.1)		11B.2.1.2 Interpret codes, regulations, and information found on drawings and specifications pertaining to wood and wood products. (A6.3)	11C.2.1.2 Identify hazards and describe safe work practices pertaining to handling non-wood products. (A7.2)
	10.2.1.3 Identify hazards and describe safe work practices pertaining to handling non-wood products. (A7.2)		11B.2.1.3 Identify types of wood, and describe their characteristics and applications. (A6.4)	11C.2.1.3 Interpret codes, regulations, and information found on drawings and specifications pertaining to non-wood products. (A7.3)



8584 <b>Introduction to Carpentry (9)</b> 15S / 15E / 15M 10S / 10E / 10M	8585 <b>Carpentry Fundamentals (10)</b> 20S / 20E / 20M	9188 <b>Carpentry Tools and Equipment (11A)</b> 30S / 30E / 30M	9189 <b>Framing (11B)</b> 30S / 30E / 30M	9190 <b>Interior/Exterior Finishing (11C)</b> 30S / 30E / 30M
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**Goal 2:** Demonstrate the identification, installation, and management of **materials**. *(continued)*

**GLO 2.1:** Demonstrate the identification, installation, and management of **materials**. *(continued)*

	11B.2.1.4 Identify types of wood products, and describe their characteristics and applications. (A6.5)	11C.2.1.4 Identify tools and equipment used with non-wood products, and describe their applications and procedures for use. (A7.4)
	11B.2.1.5 Identify wood defects. (A6.6)	11C.2.1.5 Identify types of non-wood products, and describe their characteristics and applications. (A7.5)
	11B.2.1.6 Describe wood processing. (A6.7)	11C.2.1.6 Describe the procedures used to select, handle, and store non-wood products. (A7.6)
	11B.2.1.7 Describe the procedures used to select, handle, and store wood products. (A6.8)	

8584 <b>Introduction to Carpentry (9)</b> 15S / 15E / 15M 10S / 10E / 10M	8585 <b>Carpentry Fundamentals (10)</b> 20S / 20E / 20M	9188 <b>Carpentry Tools and Equipment (11A)</b> 30S / 30E / 30M	9189 <b>Framing (11B)</b> 30S / 30E / 30M	9190 <b>Interior/Exterior Finishing (11C)</b> 30S / 30E / 30M
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**Goal 3:** Demonstrate the identification, use, and management of **tools, equipment, fasteners, and adhesives.**

**GLO 3.1:** Demonstrate the identification, use, and management of **tools and equipment.**

9.3.1.1 Identify hazards and describe safe work practices pertaining to tools and equipment. (A3.2)	10.3.1.1 →	11A.3.1.1 →	11B.3.1.1 →	11C.3.1.1 →
9.3.1.2 Define terminology associated with tools and equipment. (A3.1)	10.3.1.2 →	11A.3.1.2 Identify types of hand, power, pneumatic, stationary, measuring, and layout tools and equipment, and describe their applications and procedures for use. (A3.4) <i>(The remainder of this objective is taught in course #9194.)</i>		
9.3.1.3 Identify tools and equipment.	10.3.1.3 Identify the factors to consider when selecting tools and equipment. (A3.7)	11A.3.1.3 Describe the procedures used to inspect, maintain, and store hand, power, pneumatic, stationary, measuring, and layout tools and equipment, and describe their applications and procedures for use. (A3.6) <i>(The remainder of this objective is taught in course #9194.)</i>		

8584 <b>Introduction to Carpentry (9)</b> 15S / 15E / 15M 10S / 10E / 10M	8585 <b>Carpentry Fundamentals (10)</b> 20S / 20E / 20M	9188 <b>Carpentry Tools and Equipment (11A)</b> 30S / 30E / 30M	9189 <b>Framing (11B)</b> 30S / 30E / 30M	9190 <b>Interior/Exterior Finishing (11C)</b> 30S / 30E / 30M
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**Goal 3:** Demonstrate the identification, use, and management of **tools, equipment, fasteners, and adhesives.**  
(continued)

**GLO 3.1:** Demonstrate the identification, use, and management of **tools and equipment.** (continued)

11A.3.1.4 Demonstrate the use of hand, power, pneumatic, stationary, measuring, and layout tools and equipment, and describe their applications and procedures for use.  
(A3.8) (The remainder of this objective is taught in course #9194.)

**GLO 3.2:** Demonstrate the identification, use, and management of **fasteners and adhesives.**

9.3.2.1 Identify fasteners and adhesives.

10.3.2.1 Demonstrate the identification, use, and management of fasteners and adhesives.

11A.3.2.1 →

11B.3.2.1 →

11C.3.2.1 →

8584 <b>Introduction to Carpentry (9)</b> 15S / 15E / 15M 10S / 10E / 10M	8585 <b>Carpentry Fundamentals (10)</b> 20S / 20E / 20M	9188 <b>Carpentry Tools and Equipment (11A)</b> 30S / 30E / 30M	9189 <b>Framing (11B)</b> 30S / 30E / 30M	9190 <b>Interior/Exterior Finishing (11C)</b> 30S / 30E / 30M
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**Goal 4:** Demonstrate the basic **skills** of carpentry.

**GLO 4.1:** Demonstrate the skills related to **project drawings and specifications.**

9.4.1.1 Demonstrate an awareness of project drawings.	10.4.1.1 Define terminology associated with project drawings and specifications. (B2.1)	—	11B.4.1.1 Interpret codes, regulations, and specifications pertaining to project drawings, specifications, and trade documentation. (B2.2) <i>(This objective is also taught in course #9191.)</i>	—
	10.4.1.2 Identify drafting instruments and describe their applications and procedures for use. (B2.5)		11B.4.1.2 Identify types of specification documents, and describe their applications. (B2.3) <i>(This objective is also taught in course #9192.)</i>	
	10.4.1.3 Identify drawing projections and views, and describe their applications. (B2.7)		11B.4.1.3 Identify types of drawings, and describe their applications. (B2.4)	

8584 <b>Introduction to Carpentry (9)</b> 15S / 15E / 15M 10S / 10E / 10M	8585 <b>Carpentry Fundamentals (10)</b> 20S / 20E / 20M	9188 <b>Carpentry Tools and Equipment (11A)</b> 30S / 30E / 30M	9189 <b>Framing (11B)</b> 30S / 30E / 30M	9190 <b>Interior/Exterior Finishing (11C)</b> 30S / 30E / 30M
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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.1:** Demonstrate the skills related to **project drawings and specifications**. *(continued)*

10.4.1.4 Demonstrate basic sketching techniques. (B2.10)

11B.4.1.4 Describe the procedures used to interpret and extract information from drawings and specifications. (B2.9)

11B.4.1.5 Demonstrate the literacy skills required to interpret, extract, and apply information from drawings and specifications.

**GLO 4.2:** Demonstrate the carpentry skills related to **layout, measurement, and assembly**.

9.4.2.1 Transfer information from drawings to projects.

10.4.2.1 Demonstrate the skills required to lay out projects.

—

11B.4.2.1 Demonstrate the skills required to lay out projects.

11C.4.2.1 →

9.4.2.2 Demonstrate the skills required to measure accurately.

10.4.2.2 Demonstrate the skills required to measure efficiently and accurately, to 1/16th of an inch.

11B.4.2.2 Demonstrate the skills required to perform on-centre layout.

11C.4.2.2 Demonstrate the layout, measurement, and assembly skills required to install interior/exterior finishing products.

8584 <b>Introduction to Carpentry (9)</b> 15S / 15E / 15M 10S / 10E / 10M	8585 <b>Carpentry Fundamentals (10)</b> 20S / 20E / 20M	9188 <b>Carpentry Tools and Equipment (11A)</b> 30S / 30E / 30M	9189 <b>Framing (11B)</b> 30S / 30E / 30M	9190 <b>Interior/Exterior Finishing (11C)</b> 30S / 30E / 30M
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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.2:** Demonstrate the carpentry skills related to **layout, measurement, and assembly.** *(continued)*

9.4.2.3 Demonstrate the skills required to prepare and assemble a project.	10.4.2.3 →	11B.4.2.3 Demonstrate the skills required to align framing members.
9.4.2.4 Perform basic arithmetic operations. (B1.1)	10.4.2.4 →	11B.4.2.4 Demonstrate the skills required to align panel products.
9.4.2.5 Perform linear measurement. (B1.2)	10.4.2.5 →	11B.4.2.5 Calculate area/volume. (B1.3) <i>(This objective is also taught in course #9191.)</i>
	10.4.2.6 Apply geometrical principles. (B1.5) <i>(This objective is also taught in course #9192.)</i>	11B.4.2.6 Demonstrate proficiency in manipulating fractions, decimals, ratios, and percentages.
		11B.4.2.7 Demonstrate proficiency in converting to and from metric and standard/imperial units of measure.

8584 <b>Introduction to Carpentry (9)</b> 15S / 15E / 15M 10S / 10E / 10M	8585 <b>Carpentry Fundamentals (10)</b> 20S / 20E / 20M	9188 <b>Carpentry Tools and Equipment (11A)</b> 30S / 30E / 30M	9189 <b>Framing (11B)</b> 30S / 30E / 30M	9190 <b>Interior/Exterior Finishing (11C)</b> 30S / 30E / 30M
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**Goal 5:** Follow the **ethical and legal standards** that pertain to carpentry.

**GLO 5.1:** Demonstrate an awareness of the **ethical and legal expectations** of carpenters.

—	10.5.1.1 Demonstrate an awareness of ethics and its place in the workplace.	—	11B.5.1.1 Demonstrate an awareness of the ethical expectations of carpenters.	11C.5.1.1 Demonstrate an awareness of the existence of building codes and other local regulations related to interior/exterior finishing.
	10.5.1.2 Demonstrate an awareness of the existence of building codes, guidelines, and codes of practice within the building industry.		11B.5.1.2 Demonstrate an awareness of the existence of building codes and other local regulations related to framing.	

**Goal 6:** Demonstrate **employability skills**.

**GLO 6.1:** Demonstrate **employability skills**.

9.6.1.1 Demonstrate regular attendance and punctuality.	10.6.1.1 →	11A.6.1.1 →	11B.6.1.1 →	11C.6.1.1 →
9.6.1.2 Demonstrate accountability by taking responsibility for own actions.	10.6.1.2 →	11A.6.1.2 →	11B.6.1.2 →	11C.6.1.2 →

8584 <b>Introduction to Carpentry (9)</b> 15S / 15E / 15M 10S / 10E / 10M	8585 <b>Carpentry Fundamentals (10)</b> 20S / 20E / 20M	9188 <b>Carpentry Tools and Equipment (11A)</b> 30S / 30E / 30M	9189 <b>Framing (11B)</b> 30S / 30E / 30M	9190 <b>Interior/Exterior Finishing (11C)</b> 30S / 30E / 30M
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**Goal 6: Demonstrate employability skills. (continued)**

**GLO 6.1: Demonstrate employability skills. (continued)**

9.6.1.3 Demonstrate adaptability and effort.	10.6.1.3 →	11A.6.1.3 →	11B.6.1.3 →	11C.6.1.3 →
9.6.1.4 Demonstrate the ability to accept and follow direction and feedback.	10.6.1.4 →	11A.6.1.4 →	11B.6.1.4 →	11C.6.1.4 →
9.6.1.5 Demonstrate teamwork skills.	10.6.1.5 →	11A.6.1.5 →	11B.6.1.5 →	11C.6.1.5 →
9.6.1.6 Demonstrate the ability to stay on task and effectively use time.	10.6.1.6 →	11A.6.1.6 →	11B.6.1.6 →	11C.6.1.6 →

**GLO 6.2: Demonstrate critical thinking skills.**

9.6.2.1 Demonstrate problem-solving skills.	10.6.2.1 →	11A.6.2.1 →	11B.6.2.1 →	11C.6.2.1 →
	10.6.2.2 Demonstrate an awareness of critical thinking.		11B.6.2.2 Demonstrate an understanding of the use of critical thinking in carpentry.	



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**Goal 6:** Demonstrate **employability skills**. *(continued)*

**GLO 6.3:** Demonstrate respectful interactions with individuals of different **cultures**.

—	—	—	11B.6.3.1 Discuss and define culture.	11C.6.3.1 Demonstrate an awareness of culture in the workplace.
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**Goal 7:** Demonstrate an awareness of **sustainability** as it pertains to carpentry.

**GLO 7.1:** Describe the impact of the construction industry on **human sustainability** and the health and well-being of carpenters.

9.7.1.1 Discuss sustainability as it relates to human health and well-being.	10.7.1.1 Define sustainability as it relates to human health and well-being.	11A.7.1.1 Appreciate the impact of sustainable practices on human health and well-being.	11B.7.1.1 Identify sustainable practices that influence human health and well-being for carpenters.	—
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**GLO 7.2:** Describe the construction industry's **sustainability practices** and impact on the environment.

9.7.2.1 Demonstrate an awareness of wood and wood products as limited resources.	10.7.2.1 —→	—	11B.7.2.1 Demonstrate the efficient use of materials.	11C.7.2.1 —→
	10.7.2.2 Demonstrate an awareness of the opportunities to reduce waste and reuse materials.			11C.7.2.2 Demonstrate the ability to reuse materials.

8584 <b>Introduction to Carpentry (9)</b> 15S / 15E / 15M 10S / 10E / 10M	8585 <b>Carpentry Fundamentals (10)</b> 20S / 20E / 20M	9188 <b>Carpentry Tools and Equipment (11A)</b> 30S / 30E / 30M	9189 <b>Framing (11B)</b> 30S / 30E / 30M	9190 <b>Interior/Exterior Finishing (11C)</b> 30S / 30E / 30M
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**Goal 8:** Demonstrate an understanding of the **structure and scope** of carpentry.

**GLO 8.1:** Describe the **scope of** carpentry.

—	10.8.1.1 Demonstrate an awareness of the scope of carpentry.	—	11B.8.1.1 Demonstrate an awareness of the scope of framing.	11C.8.1.1 Demonstrate an awareness of the scope of interior and exterior finishing.
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**GLO 8.2:** Describe **apprenticeship, post-secondary education, and employment opportunities.**

—	10.8.2.1 Demonstrate an awareness of opportunities in carpentry.	—	11B.8.1.1 Demonstrate an awareness of employment opportunities in carpentry and in associated occupations.	—
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**Goal 9:** Demonstrate an understanding of the **evolution** of carpentry, including its **technological progression and emerging trends.**

**GLO 9.1:** Demonstrate an understanding of the **evolution** of carpentry, including its **technological progression and emerging trends.**

—	—	11A.9.1.1 Demonstrate an awareness of the evolution, technological progression, and emerging trends in tools and equipment.	11B.9.1.1 Demonstrate an awareness of the evolution, technological progression, and emerging trends in framing.	11C.9.1.1 Demonstrate an awareness of the evolution, technological progression, and emerging trends in interior and exterior finishing.
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## GRADE 12 CARPENTRY

General and Specific Learning  
Outcomes by Goal



# GRADE 12 CARPENTRY: GENERAL AND SPECIFIC LEARNING OUTCOMES BY GOAL

9191 <b>Surveying and Concrete (12A)</b> 40S / 40E / 40M	9192 <b>Advanced Framing (12B)</b> 40S / 40E / 40M	9193 <b>Carpentry Millwork (12C)</b> 40S / 40E / 40M	9194 <b>Applied Carpentry (12D)</b> 40S / 40E / 40M
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**Goal 1:** Describe and apply appropriate **health and safety** practices.

**GLO 1.1:** Describe and apply appropriate **health and safety** practices.

12A.1.1.1 Demonstrate an understanding of and adherence to health and safety practices.	12B.1.1.1 →	12C.1.1.1 →	12D.1.1.1 →
			12D.1.1.2 Identify safety and health requirements. (A2.1)
			12D.1.1.3 Identify electrical safety. (A2.3)
			12D.1.1.4 Identify fire safety. (A2.4)
			12D.1.1.5 Identify ergonomics. (A2.5)
			12D.1.1.6 Identify hazards of confined space entry. (A2.6)
			12D.1.1.7 Identify first aid/ CPR. (A2.7)
			12D.1.1.8 Identify and control hazards. (A2.9)

9191 <b>Surveying and Concrete (12A)</b> 40S / 40E / 40M	9192 <b>Advanced Framing (12B)</b> 40S / 40E / 40M	9193 <b>Carpentry Millwork (12C)</b> 40S / 40E / 40M	9194 <b>Applied Carpentry (12D)</b> 40S / 40E / 40M
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**Goal 1:** Describe and apply appropriate **health and safety** practices. *(continued)*

**GLO 1.2:** Demonstrate knowledge of the **Trade Safety Awareness Manual**.

—	—	—	<p>12D.1.2.1 Explain the importance of trade safety and health in reducing injuries and fatalities to young employees in Manitoba. (TSA 1)</p> <p>12D.1.2.2 Describe the rights and responsibilities of employees, employers, and supervisors under <i>The Workplace Safety and Health Act</i>. (TSA 2)</p> <p>12D.1.2.3 Describe the steps to use in the Right to Refuse process. (TSA 3)</p> <p>12D.1.2.4 Explain how and where to find information on workplace safety and health. (TSA 4)</p> <p>12D.1.2.5 Demonstrate how to handle a potentially dangerous work situation. (TSA 5)</p> <p>12D.1.2.6 Explain the S.A.F.E. acronym. (TSA 6)</p>
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9191 <b>Surveying and Concrete (12A)</b> 40S / 40E / 40M	9192 <b>Advanced Framing (12B)</b> 40S / 40E / 40M	9193 <b>Carpentry Millwork (12C)</b> 40S / 40E / 40M	9194 <b>Applied Carpentry (12D)</b> 40S / 40E / 40M
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**Goal 1:** Describe and apply appropriate **health and safety** practices. *(continued)*

**GLO 1.2:** Demonstrate knowledge of the **Trade Safety Awareness Manual**. *(continued)*

12D.1.2.7 Define workplace safety and health hazards. (TSA 7)

12D.1.2.8 Give examples of trade-specific workplace safety and health hazards. (TSA 8)

12D.1.2.9 Give examples of five types of safety and health hazards. (TSA 9)

12D.1.2.10 Define workplace safety and health risk. (TSA 10)

12D.1.2.11 Give examples of trade-specific workplace safety and health risks. (TSA 11)

12D.1.2.12 Explain the principles of hazard recognition and control as they apply to carpentry. (TSA 12)

12D.1.2.13 Explain the Workplace Hazardous Material Information System (WHMIS). (TSA 13)

9191 <b>Surveying and Concrete (12A)</b> 40S / 40E / 40M	9192 <b>Advanced Framing (12B)</b> 40S / 40E / 40M	9193 <b>Carpentry Millwork (12C)</b> 40S / 40E / 40M	9194 <b>Applied Carpentry (12D)</b> 40S / 40E / 40M
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**Goal 1:** Describe and apply appropriate **health and safety** practices. *(continued)*

**GLO 1.2:** Demonstrate knowledge of the *Trade Safety Awareness Manual*. *(continued)*

12D.1.2.14 Match the WHMIS hazardous materials symbols and their meanings. (TSA 14)

12D.1.2.15 Describe the importance of the Material Safety Data Sheets (MSDS). (TSA 15)

12D.1.2.16 Describe the importance of using personal protective equipment (PPE). (TSA 16)

12D.1.2.17 Demonstrate the proper selection and use of a variety of personal protective equipment and fall protection systems. (TSA 17)

12D.1.2.18 Outline the safety principles for working on and around electrical equipment. (TSA 18)

12D.1.2.19 Outline the workplace fire safety principles. (TSA 19)



9191 <b>Surveying and Concrete (12A)</b> 40S / 40E / 40M	9192 <b>Advanced Framing (12B)</b> 40S / 40E / 40M	9193 <b>Carpentry Millwork (12C)</b> 40S / 40E / 40M	9194 <b>Applied Carpentry (12D)</b> 40S / 40E / 40M
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**Goal 1:** Describe and apply appropriate **health and safety** practices. *(continued)*

**GLO 1.2:** Demonstrate knowledge of the *Trade Safety Awareness Manual*. *(continued)*

12D.1.2.20 Identify the hazards in confined spaces and the preparation needed to work in a confined space. (TSA 20)

**Goal 2:** Demonstrate the identification, installation, and management of **materials**.

**GLO 2.1:** Demonstrate the identification, installation, and management of **materials**.

12A.2.1.1 Demonstrate the identification, installation, and management of materials.

12B.2.1.1 →

12C.2.1.1 →

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**Goal 3:** Demonstrate the identification, use, and management of **tools, equipment, fasteners, and adhesives**.

**GLO 3.1:** Demonstrate the identification, use, and management of **tools and equipment**.

12A.3.1.1 Demonstrate the identification, use, and management of tools and equipment used in surveying and concrete.

12B.3.1.1 Define terminology associated with temporary access equipment and structures. (B3.1)

12C.3.1.1 Demonstrate the identification, use, and management of tools, equipment, and hardware used in millwork.

12D.3.1.1 Identify types of gas, diesel, and powder-actuated tools and equipment, and material-handling equipment, and describe their applications and procedures for use. (A3.4) *(The remainder of this objective is taught in course #9188.)*

9191 <b>Surveying and Concrete (12A)</b> 40S / 40E / 40M	9192 <b>Advanced Framing (12B)</b> 40S / 40E / 40M	9193 <b>Carpentry Millwork (12C)</b> 40S / 40E / 40M	9194 <b>Applied Carpentry (12D)</b> 40S / 40E / 40M
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**Goal 3:** Demonstrate the identification, use, and management of **tools, equipment, fasteners,** and **adhesives.**  
(continued)

**GLO 3.1:** Demonstrate the identification, use, and management of **tools and equipment.** (continued)

12B.3.1.2 Identify hazards and describe safe work practices pertaining to temporary access equipment and structures. (B3.2)

12B.3.1.3 Interpret codes, regulations, and information found on drawings and specifications pertaining to temporary access equipment, structures, and hoarding. (B3.3)

12B.3.1.4 Identify types of temporary access equipment and structures and their components, and describe their applications, limitations, and procedures for use. (B3.4)

12D.3.1.2 Describe the procedures used to inspect, maintain, and store gas, diesel, and powder-actuated tools and equipment, and material-handling equipment. (A3.6) *(The remainder of this objective is taught in course #9188.)*

12D.3.1.3 Demonstrate the use of gas, diesel, and powder-actuated tools and equipment, and material-handling equipment. (A3.8) *(The remainder of this objective is taught in course #9188.)*

12D.3.1.4 Identify types of hoarding and describe their purpose and applications, and the associated equipment and materials used to construct hoarding. (B3.5)

9191 <b>Surveying and Concrete (12A)</b> 40S / 40E / 40M	9192 <b>Advanced Framing (12B)</b> 40S / 40E / 40M	9193 <b>Carpentry Millwork (12C)</b> 40S / 40E / 40M	9194 <b>Applied Carpentry (12D)</b> 40S / 40E / 40M
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**Goal 3:** Demonstrate the identification, use, and management of **tools, equipment, fasteners, and adhesives.**  
*(continued)*

**GLO 3.1:** Demonstrate the identification, use, and management of **tools and equipment.** *(continued)*

12B.3.1.5 Identify types of material-handling equipment, and describe their applications and procedures for use. (A3.5)

12D.3.1.5 Identify types of lifting, rigging, and hoisting equipment and accessories, and describe their applications, limitations, and procedures for use. (B3.6)

12D.3.1.6 Identify the considerations and procedures used for installing, securing, dismantling, storing, and maintaining temporary access structures. (B3.7)

12D.3.1.7 Identify the methods of communication used during lifting, rigging, and hoisting operations, and describe their associated procedures. (B3.10)

12D.3.1.8 Identify the considerations when modifying existing scaffold structures and describe the procedures used. (B3.11)

9191 <b>Surveying and Concrete (12A)</b> 40S / 40E / 40M	9192 <b>Advanced Framing (12B)</b> 40S / 40E / 40M	9193 <b>Carpentry Millwork (12C)</b> 40S / 40E / 40M	9194 <b>Applied Carpentry (12D)</b> 40S / 40E / 40M
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**Goal 3:** Demonstrate the identification, use, and management of **tools, equipment, fasteners,** and **adhesives.**  
(continued)

**GLO 3.2:** Demonstrate the identification, use, and management of **fasteners and adhesives.**

12A.3.2.1 Demonstrate the identification, use, and management of fasteners and adhesives.	12B.3.2.1 →	12C.3.2.1 →	12D.3.2.1 →
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**Goal 4:** Demonstrate the basic **skills** of carpentry.

**GLO 4.1:** Demonstrate the skills related to **project drawings and specifications.**

12A.4.1.1 Interpret codes, regulations, and specifications pertaining to project drawings, specifications, and trade documentation. (B2.2) <i>(This objective is also taught in course #9189.)</i>	12B.4.1.1 Identify types of specification documents and describe their applications. (B2.3) <i>(This objective is also taught in course #9189.)</i>	12C.4.1.1 Demonstrate the ability to interpret blueprints and to produce drawings and layouts.	12D.4.1.1 Identify documentation related to modifications of drawings and specifications, and describe their applications. (B2.6)
			12D.4.1.2 Explain resolution protocols to follow when a conflict is identified within a set of project documents. (B2.8)
			12D.4.1.3 Demonstrate the literacy skills required to participate fully in the construction or renovation of a structure.

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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.2:** Demonstrate the carpentry skills related to **layout, measurement, and assembly.**

<p>12A.4.2.1 Calculate area/volume. (B1.3) <i>(This objective is also taught in course #9189.)</i></p>	<p>12B.4.2.1 Calculate ratios/proportions. (B1.4)</p>	<p>12C.4.2.1 Demonstrate the ability to calculate board feet of lumber.</p>	<p>12D.4.2.1 Demonstrate the process of assembling projects.</p>
	<p>12B.4.2.2 Apply geometrical principles. (B1.5) <i>(This objective is also taught in course # 8585.)</i></p>	<p>12C.4.2.2 Demonstrate the knowledge and skills related to joinery and casework.</p>	<p>12D.4.2.2 Demonstrate the layout, measurement, and assembly skills and knowledge required to participate fully in the construction or renovation of a structure.</p>
	<p>12B.4.2.3 Demonstrate the process of framing floors, walls, and roofs.</p>	<p>12C.4.2.3 Demonstrate the process of assembling stairs, cabinets, or furniture.</p>	
		<p>12C.4.2.4 Demonstrate an awareness of the installation of stairs or cabinets.</p>	

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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.3:** Demonstrate the ability to determine **elevations** and lay out **building lines**.

12A.4.3.1 Define terminology associated with site layout and the layout of building lines. (A4.1)

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12A.4.3.2 Identify hazards and describe safe work practices pertaining to site layout and the layout of building lines. (A4.2)

12A.4.3.3 Interpret codes, regulations, applicable covenants, and information found on drawings and specifications pertaining to site layout and the layout of building lines. (A4.3)

12A.4.3.4 Identify tools and equipment used to perform site layout and the layout of building lines, and describe their applications and procedures for use. (A4.4)

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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.3:** Demonstrate the ability to determine **elevations** and lay out **building lines**. *(continued)*

12A.4.3.5 Explain surveying theory as it pertains to site layout. (A4.5)

12A.4.3.6 Describe the procedures used to perform site layout. (A4.6)

12A.4.3.7 Perform calculations pertaining to site layout and layout of building lines. (A4.7)

12A.4.3.8 Use site layout equipment to determine elevations and lay out building lines. (A4.8)

**GLO 4.4:** Demonstrate the knowledge and skills associated with **concrete foundations**.

12A.4.4.1 Define terminology associated with **concrete and concrete products**. (C1.1)

12A.4.4.2 Identify hazards and describe safe work practices pertaining to concrete and concrete products. (C1.2)

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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.4:** Demonstrate the knowledge and skills associated with **concrete foundations**. *(continued)*

12A.4.4.3 Interpret codes, regulations, and information found on drawings and specifications pertaining to concrete and concrete products. (C1.3)

12A.4.4.4 Identify tools and equipment used to test, consolidate, and finish concrete, and describe their applications and procedures for use. (C1.4)

12A.4.4.5 Identify concrete products, structures, and components, and describe their characteristics and applications. (C1.5)

12A.4.4.6 Identify types of concrete reinforcement and describe their applications. (C1.6)

12A.4.4.7 Identify types of embedded materials and describe their applications. (C1.7)



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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.4:** Demonstrate the knowledge and skills associated with **concrete foundations**. *(continued)*

12A.4.4.8 Describe the effects of water/cement ratio on concrete. (C1.8)

12A.4.4.9 Describe the effects of aggregate size on concrete. (C1.9)

12A.4.4.10 Identify additives/admixtures used in concrete and describe their purpose and applications. (C1.10)

12A.4.4.11 Identify types of concrete tests and describe their associated procedures. (C1.11)

12A.4.4.12 Identify types of joints and describe their applications. (C1.12)

12A.4.4.13 Describe the procedures used to place, consolidate, and finish concrete and to facilitate the curing of concrete. (C1.13)

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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.4:** Demonstrate the knowledge and skills associated with **concrete foundations**. *(continued)*

12A.4.4.14 Demonstrate the procedures to mix, place, consolidate, and finish concrete and to facilitate the curing of concrete. (C1.14)

12A.4.4.15 Perform the slump/compression test. (C1.15)

12A.4.4.16 Define terminology associated with **footings, slab-on-grade, and grade beam forms**. (C2.1)

12A.4.4.17 Identify hazards and describe safe work practices pertaining to footings, slab-on-grade, and grade beam forms. (C2.2)

12A.4.4.18 Interpret codes, regulations, and information found on drawings and specifications pertaining to the construction of footings, slab-on-grade, and grade beam forms. (C2.3)

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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.4:** Demonstrate the knowledge and skills associated with **concrete foundations**. *(continued)*

12A.4.4.19 Identify tools and equipment used to construct footings, slab-on-grade, and grade beam forms, and describe their applications and procedures for use. (C2.4)

12A.4.4.20 Identify types of footings, slab-on-grade, grade beam forms, form materials, and accessories, and describe their characteristics and applications. (C2.5)

12A.4.4.21 Identify the steps involved and factors to consider in the preparation of a site for construction of footings, slab-on-grade, and grade beam forms. (C2.6)

12A.4.4.22 Identify types of piles and piers, and describe their characteristics and applications. (C2.7)

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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.4:** Demonstrate the knowledge and skills associated with **concrete foundations**. *(continued)*

12A.4.4.23 Describe the procedures used to construct, dismantle, and recondition footings, slab-on-grade, and grade beam forms. (C2.8)

12A.4.4.24 Identify types of embedded materials used in footings, slab-on-grade, and grade beam forms, and describe their characteristics and applications. (C2.9)

12A.4.4.25 Describe the procedures used to place embedded materials in footings, slab-on-grade, and grade beam forms. (C2.10)

12A.4.4.26 Calculate materials needed to construct footings, slab-on-grade, and grade beam forms, and calculate the volume of concrete required. (C2.11)

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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.4:** Demonstrate the knowledge and skills associated with **concrete foundations**. *(continued)*

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12A.4.4.27 Lay out and construct footings, slab-on-grade, and grade beam forms. (C2.12)

12A.4.4.28 Define terminology associated with **wall forms**. (C3.1)

12A.4.4.29 Identify hazards and describe safe work practices pertaining to wall forms. (C3.2)

12A.4.4.30 Interpret codes, regulations, and information found on drawings and specifications pertaining to wall forms. (C3.3)

12A.4.4.31 Identify tools and equipment used with wall forms, and describe their applications and procedures for use. (C3.4)

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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.4:** Demonstrate the knowledge and skills associated with **concrete foundations**. *(continued)*

12A.4.4.32 Identify types of wall form systems, and describe their characteristics and applications. (C3.5)

12A.4.4.33 Identify types of wall form system components, accessories, and materials, and describe their purpose and applications. (C3.6)

12A.4.4.34 Describe the procedures used to construct, dismantle, and recondition wall forms. (C3.7)

12A.4.4.35 Identify types of embedded materials used in wall forms, and describe their characteristics and applications. (C3.8)

12A.4.4.36 Describe the procedures used to place embedded materials in wall forms. (C3.9)

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**Goal 4:** Demonstrate the basic **skills** of carpentry. *(continued)*

**GLO 4.4:** Demonstrate the knowledge and skills associated with **concrete foundations**. *(continued)*

12A.4.4.37 Calculate materials needed to construct wall forms, and calculate the volume of concrete required. (C3.10)

12A.4.4.38 Demonstrate the procedures to lay out and construct a wall form. (C3.11)

**Goal 5:** Follow the **ethical and legal standards** that pertain to carpentry.

**GLO 5.1:** Demonstrate an awareness of the **ethical and legal expectations** of carpenters.

12A.5.1.1 Demonstrate an awareness of the existence of building codes and other local regulations related to concrete.

12B.5.1.1 Interpret regulations and specifications pertaining to tools and equipment. (A3.3)

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12D.5.1.1 Discuss instances when carpenters performed their responsibilities unethically, along with the ensuing consequences.

**Goal 6:** Demonstrate **employability skills**.

**GLO 6.1:** Demonstrate **employability skills**.

12A.6.1.1 Demonstrate regular attendance and punctuality.

12B.6.1.1 →

12C.6.1.1 →

12D.6.1.1 →

12A.6.1.2 Demonstrate accountability by taking responsibility for own actions.

12B.6.1.2 →

12C.6.1.2 →

12D.6.1.2 →

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**Goal 6:** Demonstrate **employability skills.** *(continued)*

**GLO 6.1:** Demonstrate **employability skills.** *(continued)*

12A.6.1.3 Demonstrate adaptability and effort.	12B.6.1.3 →	12C.6.1.3 →	12D.6.1.3 →
12A.6.1.4 Demonstrate the ability to accept and follow direction and feedback.	12B.6.1.4 →	12C.6.1.4 →	12D.6.1.4 →
12A.6.1.5 Demonstrate teamwork skills.	12B.6.1.5 →	12C.6.1.5 →	12D.6.1.5 →
12A.6.1.6 Demonstrate the ability to stay on task and use time effectively.	12B.6.1.6 →	12C.6.1.6 →	12D.6.1.6 →

**GLO 6.2:** Demonstrate **critical thinking** skills.

12A.6.2.1 Demonstrate problem-solving skills.	12B.6.2.1 →	12C.6.2.1 →	12D.6.2.1 Demonstrate the ability to solve complex, multi-stage problems related to the design, construction, and/or renovation of structures.
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**GLO 6.3:** Demonstrate respectful interactions with individuals of different **cultures.**

12A.6.3.1 Demonstrate an awareness of cultural differences in the workplace.	12B.6.3.1 →	12C.6.3.1 Demonstrate an awareness of how people's culture affects their values and behaviour.	12D.6.3.1 Demonstrate respectful interactions with individuals of different cultures.
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**Goal 7:** Demonstrate an awareness of **sustainability** as it pertains to carpentry.

**GLO 7.1:** Describe the impact of the construction industry on **human sustainability** and the health and well-being of carpenters.

12A.7.1.1 Demonstrate an awareness of the sustainability of the carpenter’s working conditions, including working hours and out-of town travels, shift work, and so on.	12B.7.1.1 Demonstrate an awareness of the sustainability of the carpenter’s working conditions.	12C.7.1.1 →	—
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**GLO 7.2:** Describe the construction industry’s **sustainability practices** and impact on the environment.

12A.7.2.1 Demonstrate the ability to reuse materials.	12B.7.2.1 Demonstrate the efficient use of materials.	12C.7.2.1 →	—
		12C.7.2.2 Demonstrate an awareness of local and reclaimed sources of wood (e.g., woodanchor.com).	

**Goal 8:** Demonstrate an understanding of the **structure and scope** of carpentry.

**GLO 8.1:** Describe the **scope of** carpentry.

12A.8.1.1 Demonstrate an awareness of the scope of surveying and concrete.	12B.8.1.1 Demonstrate an awareness of the scope of framing.	12C.8.1.1 Demonstrate an awareness of the scope of millwork.	12D.8.1.1 Describe the structure and scope of the modern carpenter trade. (A1.1)
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**Goal 8:** Demonstrate an understanding of the **structure and scope** of carpentry. *(continued)*

**GLO 8.2:** Describe **apprenticeship, post-secondary education, and employment opportunities.**

12A.8.2.1 Describe employment opportunities in surveying and concrete.	12B.8.2.1 Describe employment opportunities in framing.	12C.8.2.1 Describe employment opportunities in millwork.	12D.8.2.1 Describe the Apprenticeship Manitoba carpenter program. (A1.2)
			12D.8.2.2 Describe special challenges and opportunities regarding apprenticeship training. (A1.3)
			12D.8.2.3 Demonstrate an awareness of accommodations for apprentices with disabilities. (A1.4)

**Goal 9:** Demonstrate an understanding of the **evolution** of carpentry, including its **technological progression and emerging trends.**

**GLO 9.1:** Demonstrate an understanding of the **evolution** of carpentry, including its **technological progression and emerging trends.**

12A.9.1.1 Demonstrate an awareness of the evolution of surveying and concrete, including its technological progression and emerging trends.	12B.9.1.1 Demonstrate an awareness of the evolution of framing, including its technological progression and emerging trends.	12C.9.1.1 Demonstrate an awareness of the evolution of millwork, including its technological progression and emerging trends.	—
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# BIBLIOGRAPHY



## BIBLIOGRAPHY

- Apprenticeship Manitoba. *Carpentry Level 1*. Sept. 2016. [www.manitoba.ca/wd/apprenticeship/pdfpubs/pubs/discover/mb\\_trades/carpenter/carpenter\\_lev1.pdf](http://www.manitoba.ca/wd/apprenticeship/pdfpubs/pubs/discover/mb_trades/carpenter/carpenter_lev1.pdf)
- . *Instructor Trade Safety Awareness Manual*. 2013. [www.gov.mb.ca/wd/apprenticeship/pdfpubs/pubs/general/trade\\_safety/instructor.pdf](http://www.gov.mb.ca/wd/apprenticeship/pdfpubs/pubs/general/trade_safety/instructor.pdf) (24 Jan. 2017).
- Balodis, Andris. *Carpentry: Canadian Resource Supplement*. 5th ed. Homewood, IL: American Technical Publishers, 2009.
- Burrows, John. *Canadian Wood-Frame House Construction*. 2nd ed. Ottawa, ON: Canada Mortgage and Housing Corporation, 2005.
- Canadian Commission on Building and Fire Codes. *National Building Code of Canada 2015*. Ottawa, ON: National Research Council, 2015.
- Feirer, Mark D., John L. Feirer, and McGraw-Hill Construction. *Carpentry and Building Construction*. Woodland Hills, CA: Glencoe/McGraw Hill, 2010.
- . *Carpentry and Building Construction*. Instructor annotated ed. Woodland Hills, CA: Glencoe/McGraw Hill, 2010.
- Glencoe/McGraw-Hill. *Carpentry and Building Construction: Carpentry & Mathematics Applications Workbook*. Woodland Hills, CA: Glencoe/McGraw Hill, 2010.
- Koel, Leonard. *Carpentry*. 5th ed. Homewood, IL: American Technical Publishers, 2009.
- Manitoba. “Information for Instructors and Educators.” *Apprenticeship Manitoba*. [www.gov.mb.ca/wd/apprenticeship/generalinfo/instructoreducators.html](http://www.gov.mb.ca/wd/apprenticeship/generalinfo/instructoreducators.html) (24 Jan. 2017).
- . “Manitoba Trades.” *Apprenticeship Manitoba*. [www.gov.mb.ca/wd/apprenticeship/generalinfo/instructoreducators.html](http://www.gov.mb.ca/wd/apprenticeship/generalinfo/instructoreducators.html) (23 Dec. 2016).
- . “Manitoba Trades: Carpenter.” *Apprenticeship Manitoba*. [www.gov.mb.ca/wd/apprenticeship/discover/mbtrades/carpenter.html](http://www.gov.mb.ca/wd/apprenticeship/discover/mbtrades/carpenter.html) (23 Dec. 2016).
- Manitoba Education. *Technical-Vocational Education Overview*. Winnipeg, MB: Manitoba Education, 2013. Available online at [www.edu.gov.mb.ca/k12/cur/teched/sytep/docs/overview.pdf](http://www.edu.gov.mb.ca/k12/cur/teched/sytep/docs/overview.pdf).
- Manitoba Education and Advanced Learning. *Carpentry Grades 9–12 Learning Resources: A Reference for Selecting Learning Resources (March 2014)*. Winnipeg, MB: Manitoba Education and Advanced Learning, 2014. Available online at [www.edu.gov.mb.ca/k12/learnres/tech\\_voc/carpentry\\_9-12\\_bib.pdf](http://www.edu.gov.mb.ca/k12/learnres/tech_voc/carpentry_9-12_bib.pdf).
- Manitoba Education and Training. “Industrial Arts.” *Technology Education*. [www.edu.gov.mb.ca/k12/cur/teched/ind\\_arts.html](http://www.edu.gov.mb.ca/k12/cur/teched/ind_arts.html) (24 Jan. 2017).

———. “Professional Certification: Technical Vocational Teacher.” [www.edu.gov.mb.ca/k12/profcert/certificates/vocational.html](http://www.edu.gov.mb.ca/k12/profcert/certificates/vocational.html) (24 Jan. 2017).

———. *Subject Table Handbook: Technology Education: Student Records System and Professional School Personnel System.* [www.edu.gov.mb.ca/k12/docs/policy/sthte/index.html](http://www.edu.gov.mb.ca/k12/docs/policy/sthte/index.html) (23 Jan. 2017).

———. *Technology Education: Senior Years Technology Education Program.* [www.edu.gov.mb.ca/k12/cur/teched/sy\\_tech\\_program.html](http://www.edu.gov.mb.ca/k12/cur/teched/sy_tech_program.html) (23 Jan. 2017).

———. *Unit to Course Comparison (UCC) Form – Carpenter Level 1.* [www.edu.gov.mb.ca/k12/cur/teched/sytep/carpentry/ucc.pdf](http://www.edu.gov.mb.ca/k12/cur/teched/sytep/carpentry/ucc.pdf) (24 Jan. 2017).

McDonnell, Leo P. *The Use of Hand Woodworking Tools.* Clifton Park, NY: Delmar Publishers, 1978.

McDonnell, Leo P., and Alison I. Kaumeheiwa. *The Use of Portable Power Tools.* Albany, NY: Delmar Cengage Learning, 1980.

Pearson Education. *Carpentry: Level 1: Trainee Guide.* Toronto, ON: Pearson Canada Inc., 2013.

Proctor, Thomas E. *Carpentry Workbook.* 5th ed. Homewood, IL: American Technical Publishers, 2008.

Red River College. “Technical Vocational Teacher Education.” *Program and Course Catalogue.* <http://me.rrc.mb.ca/Catalogue/ProgramInfo.aspx?ProgCode=TECVF-DP&RegionCode=WPG> (24 Jan. 2017).

Red Seal Program. *Carpenter.* 13 Jan. 2016. [www.red-seal.ca/trades/c.1rp.2nt.2r-eng.html](http://www.red-seal.ca/trades/c.1rp.2nt.2r-eng.html) (24 Jan. 2017).

Vogt, Floyd, Michael Nauth, and Nelson Education. *Carpentry* 2nd Canadian ed. Scarborough, ON: Nelson Education Ltd., 2013.





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